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BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Paper No. 20040401

Application Number: 09/120,608
Filing Date: July 22, 1998
Appellant(s): PAGE ET AL.

Bart E. Lerman
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed 1/20/04.

(1) Real Party in Interest

A statement identifying the real party in interest is contained in the brief.

(2) Related Appeals and Interferences

A statement identifying the related appeals and interferences which will directly affect or be directly affected by or have a bearing on the decision in the pending appeal is contained in the brief.

(3) Status of Claims

The statement of the status of the claims contained in the brief is correct.

(4) Status of Amendments After Final

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

(5) Summary of Invention

The summary of invention contained in the brief is correct.

(6) Issues

The appellant's statement of the issues in the brief is correct.

(7) Grouping of Claims

The rejection of claims 13-23 stand or fall together because appellant's brief does not include a statement that this grouping of claims does not stand or fall together and reasons in support thereof. See 37 CFR 1.192(c)(7).

(8) Claims Appealed

The copy of the appealed claims contained in the Appendix to the brief is correct.

(9) Prior Art of Record

EP 851014	Ma et al.	7-1998
5,085,698	Ma et al.	2-1992

(10) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

1. Claims 13-23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ma et al. (EP 0851014) in view of Ma et al. '698 (U.S. 5,085,698).

Ma et al. '014 disclose an ink jet ink suitable for ink jet printing wherein the ink contains (1) aqueous carrier medium containing 60-95% water and water-soluble organic solvent (page 2, line 52-page 3, line 4) which would intrinsically form single phase vehicle with water, (2) insoluble colorant such as pigment (page 3, lines 9-10 and 30-32), (3) dispersant (page 3, line 44), (4) surfactant such as Zonyl which is a fluorinated surfactant (page 5, line 48 and page 20,

line 21), and (5) water-insoluble graft copolymer (page 5, lines 17 and 31-32). It is further disclosed that the ink is suitable for printing on fabric, i.e. textiles (page 6, line 20).

The graft copolymer contains a backbone containing hydrophobic monomers such as methyl (meth)acrylate, ethyl (meth)acrylate, propyl (meth)acrylate, n-butyl (meth)acrylate, phenyl (meth)acrylate, hexyl (meth)acrylate, 2-ethylhexyl (meth)acrylate, benzyl (meth)acrylate, phenylethyl (meth)acrylate, and hydroxyethyl (meth)acrylate (page 4, lines 11-20). The hydrophilic side chains are formed by copolymerizing non-ionic monomers such as 2-(2-methoxyethoxy)ethyl (meth)acrylate, ethoxytriethyleneglycol methacrylate, methoxy polyethyleneglycol methacrylate, and polyethyleneglycol methacrylate (page 4, lines 36-40). The amount of the functional hydrophilic groups is adjusted to control the solubility of the copolymer in the aqueous medium (page 4, lines 28-29).

With respect to the number average molecular weight, M_n, of the side chains, while it is disclosed that the hydrophilic side chains have a molecular weight of 200-1000 (page 4, lines 39-40), there is no explicit disclosure of M_n of the side chains in the reference. However, given that M_n is defined as $\Sigma N_i M_i / \Sigma N_i$ where N is the number of side chains and M is the molecular weight of an individual side chain, and in light of the fact that the "maximum" value of M is 1,000 as disclosed above, it is evident that M_n will be at least 1,000, and thus meets the claimed number average molecular weight requirement of 1,000-2,000.

Although there is no explicit disclosure that the graft copolymer is a film-forming binder, it is natural to infer that since the reference graft copolymer has a hydrophobic backbone and non-ionic hydrophilic side chains and comprises monomers identical to those presently claimed , that the reference graft copolymer will intrinsically function as a film-forming binder.

The difference between Ma et al. '014 and the present claimed invention is the requirement in the claims of (a) specific types of solvents and (b) an ink that is washfast.

With respect to difference (a), Ma et al. '014 disclose that at least one water-soluble solvent is used in the aqueous carrier medium and that the particular mixture depends on the requirements of the specific application such as desired surface tension, viscosity, drying time, etc. (page 2, lines 52-54). Ma et al. '014 then refers to Ma et al. '698 for specific types of water-soluble solvents.

Ma et al.'698, which is drawn to ink jet inks, disclose the use of solvents such as pyrrolidone and glycol ethers (col.9, lines 3-10).

Thus, one of ordinary skill in the art would have recognized that the choice of solvents depends on the desired end use, and to choose particular solvents including those presently claimed, in order to produce an ink possessing optimal drying time, surface tension, and viscosity, and thereby arrive at the claimed invention.

With respect to difference (b), there is no explicit disclosure in Ma et al. '014 that the ink is washfast. However, given that the Ma et al. '014's ink contains ingredients identical to those presently claimed, i.e. vehicle, dispersant, pigment, surfactant, and graft copolymer, it is natural to infer that the ink is intrinsically washfast.

(11) Response to Argument

In order to remain consistent with Appellants' arguments as set forth in the Appeal Brief filed 1/20/04, it is noted that in the response below EP 851014 is referred to as Ma-1 while Ma et al. (U.S. 5,085,698) is referred to as Ma-2.

In the Appeal Brief filed 1/20/04, Appellants admit that Ma-1 discloses an ink jet ink generally comprising components (a) and (b) as presently claimed and hydrosol polymer. It is noted that the hydrosol polymer corresponds to the presently graft copolymer binder.

Appellants argue that while the hydrosol polymer of Ma-1 is water-insoluble as required in the present claims, the hydrosol of Ma-1 differs from the present claims in that the hydrosol is not soluble in the aqueous vehicle but rather is insoluble in the aqueous vehicle.

In responding to Appellants' arguments, it is first noted that the ink of Ma-1 is very similar to the presently claimed aqueous coating composition or ink.

Specifically, the present claims require (a) an aqueous vehicle comprising water and at least one organic co-solvent wherein water comprises no more than 80% by weight of the total weight of the vehicle and wherein the co-solvent is water-soluble or water-miscible so as to form a single phase with water. Ma-1 discloses aqueous vehicle comprising water and at least one organic water-soluble co-solvent wherein the water is present in amount of 60-95% and co-solvent is present in amount of 5-40% (page 2, line 50-page 3, line 1). It is noted that the amounts of water and co-solvent clearly overlap those presently claimed. It is also noted that Ma-1 refers to Ma-2 for specific types of co-solvents and that the co-solvents disclosed by Ma-2 include pyrrolidone and glycol ether which are identical to solvents used in the present invention (see present claim 15). While there is no explicit disclosure in Ma-1 that the co-solvent forms a single phase vehicle with water, given that Ma-1 disclose use of water-soluble co-solvents identical to those presently claimed and in an amount that overlaps that presently claimed, it is clear that such solvents would intrinsically form single phase with water as presently claimed.

The present claims further require (b) pigment dispersion comprising pigment and a polymeric dispersant. Ma-1 discloses the use of pigment and polymeric dispersant (page 3, lines 12 and 46).

The present claims also require (c) film-forming non-ionic graft copolymer binder comprising hydrophobic backbone and non-ionic hydrophilic side chains, said side chains having number average molecular weight of at least 500. Ma-1 discloses hydrosol, i.e. graft copolymer, containing hydrophobic backbone made from monomers identical to those used to form the presently claimed hydrophobic backbone and non-ionic hydrophilic side chain made from monomers identical to those used to form the presently claimed side chains. With respect to the number average molecular weight, M_n, of the side chains, while it is disclosed that the hydrophilic side chains have a molecular weight of 200-1000 (page 4, lines 39-40), there is no explicit disclosure of M_n of the side chains in the reference. However, given that M_n is defined as $\Sigma N_i M_i / \Sigma N_i$ where N is the number of side chains and M_i is the molecular weight of an individual side chain, and in light of the fact that the "maximum" value of M is 1,000 as disclosed above, it is evident that M_n will be at least 1,000, and thus meets the claimed number average molecular weight requirement of at least 500. Further, although there is no explicit disclosure that the graft copolymer is a film-forming binder, it is natural to infer that since the reference graft copolymer has a hydrophobic backbone and non-ionic hydrophilic side chains and comprises monomers identical to those presently claimed , that the reference graft copolymer will intrinsically function as a film-forming binder.

The courts have held that "a compound and all its properties are mutually inseparable", *In re Papesch*, 315F.2d 381, 137 USPQ 42, 51 (CCPA 1963). Further, attention is drawn to

MPEP 2112.01, which states that "products of identical chemical composition can not have mutually exclusive properties. A chemical composition and its properties are inseparable. Therefore, if the prior art teaches the identical chemical structure, the properties applicant discloses and/or claims are necessarily present", *In re Spada*, 911 F.2d 705, 709, 15 USPQ2d 1655, 1658 (Fed. Cir. 1990).

Thus, given that Ma-1 discloses ink comprising aqueous vehicle comprising water and same type and amount of co-solvent, pigment, polymeric dispersant, and graft copolymer obtained from the same types of monomers as presently claimed, it is clear that the graft copolymer would intrinsically possess the same solubility as the presently claimed graft copolymer.

Appellants argue that page 4, lines 27-29 of Ma-1 teaches away from the present claims by disclosing that the hydrosol, i.e. graft copolymer, should not be soluble in the aqueous vehicle which is in direct contrast to the present claims which require that the graft copolymer is soluble in the aqueous vehicle.

However, page 4, lines 27-29 of Ma-1 does not teach that the hydrosol should not be soluble in the aqueous vehicle. Rather, this portion of Ma-1 teaches that the hydrosol should not be completely soluble in the aqueous vehicle. Due to the presence of hydrophilic functional groups, the hydrosol of Ma-1 will have some degree of solubility in the aqueous vehicle. In light of Ma-1's statement on page 4, lines 28-29 that if the hydrosol contains too many functional groups "it will become completely soluble in the aqueous medium", it is clear that

the functional groups of Ma-1 function so as to make the hydrosol at least partially soluble in the aqueous medium or vehicle.

Further, while it is agreed that Ma-1 teaches against complete solubility of the hydrosol in the aqueous vehicle, it is very significant to note that there is nothing in the present claims that requires that the graft copolymer is completely soluble in the aqueous vehicle. The present claims only require that the graft copolymer is soluble in the aqueous vehicle and thus, the present claims are open to any degree of solubility in the aqueous vehicle, i.e. from partial to complete. The requirement in the present claims that the graft copolymer is soluble in the aqueous vehicle does not require that the graft copolymer is completely soluble in the aqueous vehicle.

Thus, while Ma-1 teaches away from complete solubility of the hydrosol in the aqueous vehicle, contrary to Appellants' argument that the hydrosol is insoluble in the aqueous vehicle, the reference clearly discloses that the hydrosol has some degree of solubility in the aqueous vehicle due to the presence of hydrophilic functional groups. Given that the hydrosol does possess some degree of solubility in the aqueous vehicle, the hydrosol of Ma-1 meets the requirements of the present claims which are open to any degree of solubility.

On page 4 of the Appeal Brief, Appellants argue that while Ma-1 discloses the potential use of large amounts of co-solvent, the preferences of Ma-1 tend toward lower amounts of co-solvent. While it is not exactly clear what Appellants consider lower amounts or large amounts

of co-solvent, it is noted that the examples of Ma-1 disclose ink comprising aqueous vehicle approximately 92% water and 8% co-solvent.

However, "applicant must look to the whole reference for what it teaches. Applicant cannot merely rely on the examples and argue that the reference did not teach others." *In re Courtright*, 377 F.2d 647, 153 USPQ 735,739 (CCPA 1967). Further, "nonpreferred disclosures can be used. A nonpreferred portion of a reference disclosure is just as significant as the preferred portion in assessing the patentability of claims." *In re Nehrenberg*, 280 F.2d 161, 126 USPQ 383 (CCPA 1960).

A fair reading of Ma-1 as a whole clearly discloses the use of aqueous vehicle comprising 60-95% water and 5-40% co-solvent which clearly overlaps the presently claimed aqueous vehicle comprising no more than 80% water and thus, at least 20% co-solvent.

With respect to examiner's position that the present claims are open to graft copolymer possessing any degree of solubility in the aqueous vehicle, Appellants argue that examiner's claim language interpretation is not in line with the plain meaning of the word "soluble" particularly in view of the disclosure of the present specification.

However, the Appellants have not pointed to, nor has examiner found, any disclosure in the present specification which defines or clarifies the term "soluble". While page 3, lines 36-37 of the present specification discloses that co-solvent is typically water-soluble so as to form a single phase with water, this refers to the solubility of the co-solvent in water only and not to solubility of the graft copolymer in the aqueous vehicle. Further, given that Ma-1 discloses

aqueous vehicle comprising water and identical types and amount of co-solvent as presently claimed, it is clear that the aqueous vehicle of Ma-1 also forms single phase with water.

Appellants point to page 4, lines 11-12 of Ma-1 which discloses that the hydrosol is dispersed as a separate phase in aqueous carrier medium and note that this distinguishes the hydrosol of Ma-1 from graft copolymer presently claimed which is soluble in the aqueous vehicle.

While it is agreed that Ma-1 discloses that the hydrosol polymers are dispersed as a separate phase in the aqueous carrier medium and that the hydrosol is not completely soluble in the aqueous vehicle, it is significant to note that Ma-1 also discloses that the polymer can contain functional groups, which affect the solubility of the hydrosol. It is noted that the present claims do not specify any degree of solubility and thus the scope of the present claims encompasses binders of varying degrees of solubility in the aqueous medium. Given that the hydrosols of Ma-1 contain some amount of functional groups, i.e. hydrophilic monomers, it is the examiner's position that these hydrosols do have some degree of solubility in the aqueous medium and that this solubility can be and is fine tuned by the kind and amount of functional groups present. Controlling solubility is recognized in the present specification, page 5, lines 13-15, which discloses that by adjusting the hydrophilic/hydrophobic balance of the polymer, the solubility of the polymer in aqueous vehicle can be tailored. The examiner agrees that the hydrosol of Ma-1 is not completely soluble in the aqueous vehicle but complete solubility is not required in the present claims. The present claims only require that the graft copolymer is soluble in the aqueous vehicle and thus, are open to any degree of solubility in the aqueous vehicle, i.e. from

partial to complete, which is clearly met by Ma-1, which due to the presence of hydrophilic functional groups, discloses hydrosol possessing some degree of solubility of the aqueous vehicle.

Further, applicants argue that in certain instances that two-phase dispersed systems can be converted into single-phase mixture by presence of "effective" amount of co-solvent which is miscible in water and in which the polymer is miscible or soluble and that the relatively high amount of co-solvent set forth in the present claims presumably assists in the ability of the graft copolymer to be soluble in the aqueous vehicle.

However, given that Ma-1 discloses graft copolymer made from the same monomers as presently claimed as well as aqueous vehicle comprising water and same types and amounts of co-solvent as presently claimed, it is the examiner's position that the presently claimed graft copolymer and the hydrosol of Ma-1 would possess same solubility in aqueous vehicle.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

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CS
April 1, 2004

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